

AMENDMENTS TO THE CLAIMS

A detailed listing of all claims that are, or were, in the present application, irrespective of whether the claim(s) remain(s) under examination in the application is presented below. The claims are presented in ascending order and each includes one status identifier. Those claims not cancelled or withdrawn but amended by the current amendment utilize the following notations for amendment: 1. deleted matter is shown by strikethrough for six or more characters and double brackets for five or fewer characters; and 2. added matter is shown by underlining.

1-29. (Cancelled).

30. (Currently Amended) A method of processing material of an object by generating laser radiation delivered as laser pulses having a large spectral bandwidth, and irradiating the material with the laser pulses to process the material by causing a processing effect that creates a physical or chemical change in the material, the method comprising:

determining a spectral dependency of the processing effect before or during the processing; and

altering the generated laser radiation before or during processing to achieve defined processing effects by selectively modifying ~~one or more~~ a spectral parameter[[s]] of the laser radiation according to the spectral dependency of the processing effect,

wherein the modified spectral parameter is a spectral distribution of polarization in the laser pulses.

31. (Previously Presented) The method of Claim 30, wherein one of the following defined processing effects are evaluated when considering the spectral dependency:

an increase in processing speed, an improvement in material selectivity, an improvement in surface structuring, an achievement of an optical breakthrough, and any combination thereof.

32.-34 (Cancelled)

35. (Currently Amended) The method of Claim 30, further comprising measuring a quantity of the processing effect and dynamically modifying the ~~at least one~~ spectral parameter as a function of the measured quantity.
36. (Withdrawn) The method of Claim 35, wherein a removal rate of material processing serves as the measurable quantity.
37. (Withdrawn) The method of Claim 35, wherein a surface roughness serves as the measurable quantity.
38. (Withdrawn) The method of Claim 35, further comprising using a transmission of the object to be processed as the measurable quantity producing or processing an optical wave guide.
39. (Withdrawn) The method of Claim 35, further comprising using a reflection of electromagnetic waves as the measurable quantity for producing or processing an optical wave guide.
40. (Withdrawn) The method of Claim 35, wherein a fraction of laser light reflected by a processing zone serves as the measurable quantity.
41. (Withdrawn) The method of Claim 35, further comprising providing a component having resonance frequencies and using at least one of the resonance frequencies as the measurable quantity for producing or processing a micro-mechanical component.

42. (Withdrawn) The method of Claim 35, wherein a resonance amplitude at a defined oscillation frequency serves as the measurable quantity for producing or processing a micro-mechanical component.
43. (Withdrawn) The method of Claim 35, further comprising evaluating a hydrophobicity or a hydrophilicity of a processing surface as the measurable quantity.
44. (Withdrawn) The method of Claim 35, further comprising evaluating an anisotropy of a processed material as the measurable quantity.
45. (Withdrawn) The method of Claim 35, further comprising using a material selectivity of an interaction with composite materials as the measurable quantity in the processing of composite materials.
46. (Withdrawn) The method of Claim 35, further comprising using at least one electrical property of said microelectronic component as the measurable quantity in processing a microelectronic component.
47. (Withdrawn) The method of Claim 46, further comprising selecting said electrical property from the group consisting of: conductivity and capacitance.

47. (Withdrawn) The method of Claim 46, further comprising selecting said electrical property from the group consisting of: conductivity and capacitance.

48. (Previously Presented) The method of Claim 35, wherein the material is human eye tissue and further comprising measuring at least one plasma parameter as the measured quantity.

49. (Previously Presented) The method of Claim 48, further comprising selecting the plasma parameter from the group consisting of: an energy threshold value for an optical breakthrough, a scattered light, a plasma spectrum, and any combinations thereof.

50. (Withdrawn) The method of Claim 35, wherein, in two-photon polymerization of photosensitive materials, the measurable quantities are selected from the group consisting of: a quantum efficiency of the polymerization process, optical properties of the polymerized materials, mechanical properties of the polymerized material, and any combinations thereof.

51. (Currently Amended) The method of Claim 30, wherein determining the spectral dependency comprises testing ~~predefined ones of~~ the spectral parameter[[s]] of the laser pulses for ~~their~~ its processing effect and selecting values for the tested spectral parameter[[s]] as start values for the material processing.

52. (Currently Amended) The method of Claim 30 wherein determining the spectral dependency comprises selecting values for the spectral parameter[[s]] from test results or pre-stored data as start values for the processing.

53. – 62. (Cancelled)

63. (Currently Amended) A method for processing material of an object by generating laser radiation delivered as laser pulses having a large spectral bandwidth and irradiating the material with the laser pulses to process the material by causing a processing effect involving a physical or chemical change in the material, the method comprising:

considering a spectral dependency of the processing effect before or during the processing;
and

altering the generated laser radiation before or during the processing to optimize the processing effect by selectively modifying, according to the spectral dependency of the processing effect, the spectral composition of ~~at least one of the~~ following parameter[[s]] of the laser radiation: ~~spectral distribution of amplitude in the laser pulses, spectral distribution of phase in the laser pulses, and~~ spectral distribution of polarization in the laser pulses.

64. (Previously Presented) The method of Claim 63, wherein the laser pulses are altered by spatially separating spectral components of the laser radiation, modifying different spectral components differently and collimating the spectral components back into a pulsed laser beam, wherein the modification of the different spectral components reflects to the spectral dependency of the processing effect.

65. (Cancelled)

66. (Previously Presented) The method of Claim 30, wherein the laser pulses are altered by spatially separating spectral components of the laser radiation, modifying different spectral components differently and collimating the spectral components back into a pulsed laser beam, wherein the modification of the different spectral components reflects to the spectral dependency of the processing effect.